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CLAIMS

1. A transmitter unit for use in a multi-carrier communication system,
2 comprising:
 one or more encoders, each encoder operative to receive and code a
4 respective channel data stream to generate a corresponding coded data stream;
 a symbol mapping element coupled to the one or more encoders and
6 operative to receive and map data from one or more coded data streams to
generate modulation symbol vectors, wherein each modulation symbol vector
8 includes a plurality of data values used to modulate a plurality of tones to
generate an OFDM symbol, wherein the data from each coded data stream is
10 mapped to a respective set of one or more circuits, and wherein each circuit
includes a particular set of one or more tones; and
12 a modulator coupled to the symbol mapping element and operative to
receive and modulate the modulation symbol vectors to provide a modulated
14 signal.
2. The transmitter unit of claim 1, further comprising:
2 one or more scaling elements coupled to the one or more encoders, each
scaling element operative to receive and scale a respective coded data stream
4 with a particular scaling factor to generate a corresponding scaled data stream
that is then provided to the symbol mapping element.
3. The transmitter unit of claim 1, wherein the modulator includes
2 an inverse Fourier transform operative to receive the modulation symbol
vectors and generate a time-domain representation of each modulation symbol
4 vector to provide a corresponding OFDM symbol,
 a cyclic prefix generator coupled to the inverse Fourier transform and
6 operative to repeat a portion of each OFDM symbol to generate a
corresponding transmission symbol, and
8 an upconverter coupled to the cyclic prefix generator and operative to
modulate transmission symbols to generate the modulated signal.
4. The transmitter unit of claim 1, wherein data for each channel data
2 stream is transmitted in packets.

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24. The transmitter unit of claim 21, wherein each Walsh sequence is transmitted over multiple tones of each of the OFDM symbols used for the Walsh sequence.

25. The transmitter unit of claim 21, wherein the length of the Walsh sequence is matched to the number of tones in each OFDM symbol.

26. The transmitter unit of claim 4, wherein each packet includes a user identifier indicative an intended recipient of the packet.

27. A transmitter unit for use in a multi-carrier communication system, comprising:

one or more encoders, each encoder operative to receive and code a respective channel data stream to generate a corresponding coded data stream;
a symbol mapping element coupled to the one or more encoders and operative to receive and map data from one or more coded data streams to generate modulation symbol vectors, wherein each modulation symbol vector includes a plurality of data values used to modulate a plurality of tones to generate an OFDM symbol, wherein the data from each coded data stream is mapped to a respective set of one or more circuits, and wherein each circuit includes a respective set of one or more tones;

an inverse Fourier transform coupled to the symbol mapping element and operative to receive the modulation symbol vectors and generate a time-domain representation of each modulation symbol vector to provide a corresponding OFDM symbol;

a cyclic prefix generator coupled to the inverse Fourier transform and operative to repeat a portion of each OFDM symbol to generate a corresponding transmission symbol; and

an upconverter coupled to the cyclic prefix generator and operative to modulate transmission symbols to generate the modulated signal, and

wherein transmissions for the one or more channel data streams occurs over slots, wherein each slot includes a plurality of OFDM symbols, and wherein full rate data for a particular channel data stream is transmitted via a first circuit and lower rate data is transmitted via a second circuit.

28. A method for generating and transmitting a modulated signal, comprising:

receiving one or more channel data streams;

- 4 coding each channel data stream with a particular coding scheme to
generate a corresponding coded data stream;
- 6 mapping data from one or more coded data streams to generate
modulation symbol vectors, wherein each modulation symbol vector includes a
8 plurality of data values used to modulate a plurality of tones to generate an
OFDM symbol, wherein the data from each coded data stream is mapped to a
10 respective set of one or more circuits, and wherein each circuit includes a
particular set of one or more tones; and
- 12 modulating the modulation symbol vectors to provide a modulated
signal.

29. The method of claim 28, further comprising:

- 2 scaling each coded data stream with a particular scaling factor to
generate the corresponding scaled data stream.

30. The method of claim 28, further comprising:

- 2 generating a time-domain representation of each modulation symbol
vector to provide a corresponding OFDM symbol;
- 4 repeating a portion of each OFDM symbol to generate a corresponding
transmission symbol; and
- 6 modulating transmission symbols to generate the modulated signal.

31. A receiver unit comprising:

- 2 an antenna operative to receive a modulated signal;
a front end processor coupled to the antenna and operative to process
4 the received signal to generate samples;
a Fourier transform coupled to the front end processor and operative to
6 receive samples from the front end processor and generate transformed
representations of the samples;
- 8 a processor coupled to the Fourier transform and operative to process
the transformed representations to generate at a symbol stream corresponding
10 to a particular transmission being processed; and
a decoder coupled to the processor and operative to receive and decode
12 the symbol stream to generate decoded data,
wherein the modulated signal is generated by coding one or more
14 channel data streams with a particular coding scheme to generate one or more
coded data streams, mapping data from the one or more coded data streams to
16 generate modulation symbol vectors, and modulating the modulation symbol

